



BGQ15HAA-1 Retrofit Spark Ignition System

Installation

Parts Included

The retrofit package includes:

- (1) BGD278JBE-20BCGD gas valve
- (1) BG1600M10EK-1AA spark ignition control
- (1) Rajah adapter
- (4) 1/4 inch female quick connects
- (1) Sensing probe cable
- (1) 1/8 inch NPT to 1/4 cc elbow fitting
- (1) Reducer bushing (3/4" to 1/2" NPT)
- (1) Compression fitting (1/4" tube)
- (1) Y75RJ-1 retrofit sensor probe kit
- (1) Sensor probe extension and (1) bushing
- (2) Spacers and (1) cone shaped nut
- retrofit package installation diagram and a pressure sensitive lighting Caution sticker

Special Tools Needed

The following tools may be needed.

- manometer
- DC microammeter and AC voltmeter
- assorted pipe nipples and fittings
- On/Off toggle switch with wire leads and clips

Remove the Existing Gas Valve

IMPORTANT: Only qualified personnel should install or service BASO Gas Products. These instructions are a guide for such personnel. Carefully follow all instructions in this document and all instructions for the appliance.

IMPORTANT: Make all gas installations in accordance with applicable local, national, and regional regulations.



CAUTION: Risk of Electric Shock.
Disconnect power supply before making electrical connections to avoid electric shock.



WARNING: Risk of Explosion or Fire.
Shut off the gas supply at the main manual shutoff valve before installing or servicing the BGQ15HAA-1. Failure to shut off the gas supply can result in the release of gas during installation or servicing, which can lead to an explosion or fire, and may result in severe personal injury or death.



WARNING: Risk of Explosion, Fire, or Electric Shock. Label all wires before they are disconnected when replacing or servicing the BGQ15HAA-1. Wiring errors can cause improper or dangerous operation and may result in an explosion, fire, or electric shock leading to severe personal injury or death.

All installations must comply with local codes or, in the absence of local codes, with the National Fuel Gas Code, ANSI Z223.1, and the National Electrical Code (NEC), ANSI/NFPA 70.

To remove the existing gas valve.

1. Set the thermostat at its lowest setting.
2. Turn off the power to the appliance.
3. Turn off the gas at the main manual shutoff valve.
4. Remove the thermocouple from the gas valve.
5. Disconnect the pilot tubing from the gas valve
Disconnect all wires from the existing gas valve.
6. Carefully remove the old gas valve from the manifold.

Install the Sensing Probe and Cable

To install the sensing probe and cable:

1. Remove the thermocouple from the existing pilot burner. The pilot burner should be left on its mounting bracket if you can conveniently reach it. If not, it may be necessary to partially pull out the manifold for easy access. In some extreme cases, it may be necessary to remove the pilot. If it becomes necessary to replace the pilot burner, it must be replaced with an identical model and positioned using the original mounting.
2. Place the threaded end of the sensing probe assembly into the thermocouple hole in the pilot.
3. Check the position of the spark gap. The spark gap should be 0.1 in. (2.5 mm) nominal.
Note: Position the spark gap in the pilot gas stream. Raise or lower the spark gap by adding or removing the spacers provided between the pilot and sensing probe assembly.
4. Screw the cone shaped nut onto the probe. The small end fits into the threaded thermocouple hole to center the sensing probe and secure it in place.
5. Depending upon the appliance, the flame sensing probe may be mounted in a number of positions. Select the position providing the most clearance from metal surfaces and the main burner flame.
6. Install the sensing probe cable onto the spade connector of the sensor.
7. If the pilot burner was removed, reinstall the pilot on its bracket in the furnace using the original mounting.

Mounting

IMPORTANT: Verify that the valve is installed only in applications where the specified maximum ambient (surface) temperature and maximum operating pressures do not exceed the limits in the *Technical Specifications* section.

To install the BGQ15HAA-1 ignition system:

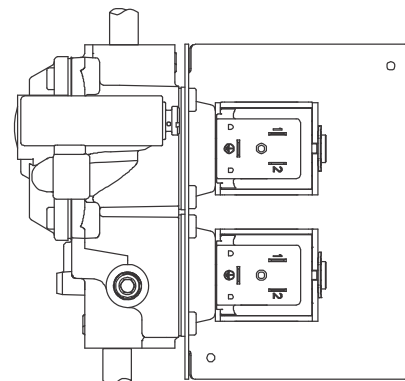
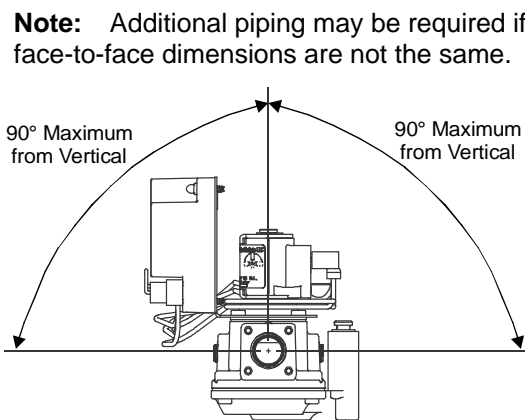
1. Compare the voltage on the valve with the power source voltage to ensure the correct unit is being installed. For valves with 25 volt coils, use an NEC, Class 2 transformer.

Note: The transformer must be mounted to a grounded metal enclosure.

2. When installing the ignition system on the manifold, ensure that the gas flows through the valve body in the direction indicated by the arrow on the valve body. If the ignition system is installed with the gas flow in the opposite direction of the arrow, leakage can occur.

IMPORTANT: Do not use a wrench on any surface other than the casting flats provided at the inlet and outlet ends of the valve body. The BGQ15HAA-1 may be damaged in the mounting process if a wrench is used on any other surface. Using a wrench incorrectly may void the warranty.

3. Mount the BGQ15HAA-1 ignition system on a horizontal manifold with the ignition control pointed up (vertical) or in a position not exceeding 90° from vertical manifold in any position around its axis (Figure 1).



Vertical mounting may be 360° around its axis with the gas flow either up or down, but always in the direction of the arrow.

Figure 1: BGQ15HAA-1 Mounting Positions

4. Mount the ignition system to the pipework. Use an approved pipe joint sealing compound on the male threads before assembling. Remove excess compound after mounting the ignition system to the pipework. Threads of the pipe and nipples must be smooth and free of tears and burrs. Steam clean all piping to remove foreign substances such as cutting oil or thread chips. A sediment trap must be installed in accordance with the National Fuel Gas Code (ANS Z223.1). See Figure 2.
5. Connect the pilot tubing to the valve assembly with the 1/8 in. NPT to 1/4 in. cc elbow fitting, if needed
6. Check for leakage.
 - a. Shut off the gas at the main manual shutoff valve and open the pressure connection between the manual shutoff valve and the BGQ15HAA-1 valve.
 - b. Connect air tubing with a maximum pressure of 1-1/2 times the valve's maximum operating pressure (as indicated on the valve) to the opened pressure connection.
 - c. Paint all valve body connections with a rich soap and water solution.

If bubbles occur, this indicates a leak. To stop a leak, tighten joints and connections. Replace the part if the leak cannot be stopped.

If bubbles do not occur, remove the air tubing and close the pressure connection.
7. Perform the *Checkout* section before leaving the installation.

! WARNING: Risk of Explosion or Fire.
 Verify that there are no gas leaks by testing with appropriate equipment. Never use a match or lighter to test for the presence of gas. Failure to test properly can lead to an explosion or fire and may result in severe personal injury or death.

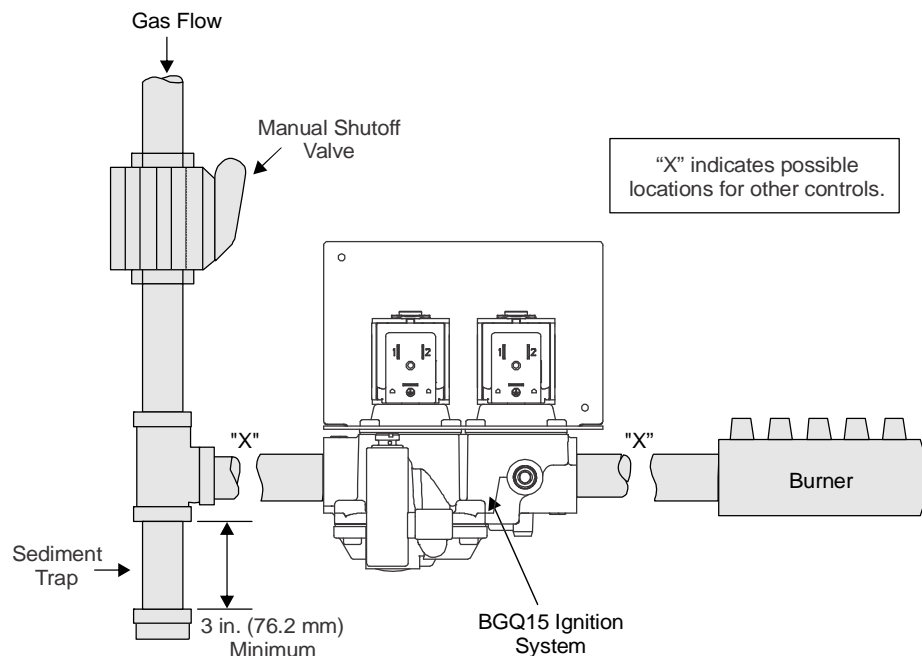


Figure 2: Typical Installation of a BGQ15HAA-1

Wiring



WARNING: Risk of Explosion or Fire.

Locate all safety, limit, and operating controls in series with the thermostat terminal (TH) on the ignition control. Improper installation may cause gas leaks, which can lead to an explosion or fire and may result in severe personal injury or death.

Refer to Figure 3 or Figure 4 for wiring diagrams. All wiring should be in accordance with the National Electrical Code (NEC) and all other local codes and regulations.

Check the voltage rating marked on the control and make sure it is suited to the application. Use a Class 2 transformer capable of providing 24 VAC under maximum load, including valves. A transformer having excessive primary impedance due to poor coupling affects the ignition potential.

The high-voltage spark transformer cable is noise suppression (resistive) type rated for at least 15 kV and must not be in continuous contact with a metal surface. Use standoff insulators. Ensure that the flame sensor wire and high voltage spark transformer cable are separated from one another by a minimum of 1/4 in. (6.35 mm) and are not wrapped around any pipe, other wiring, or accessories.

Note: A shorting plug that jumpers pins 2 and 3 of the damper connector is supplied with the control. The shorting plug must be used if a vent damper is not used. When a vent damper has been connected and power turned on, an internal fuse in the control will blow and the control will only operate with a vent damper connected. Now you cannot disconnect the vent damper plug and put back the shorting plug. The ignition control will not work.

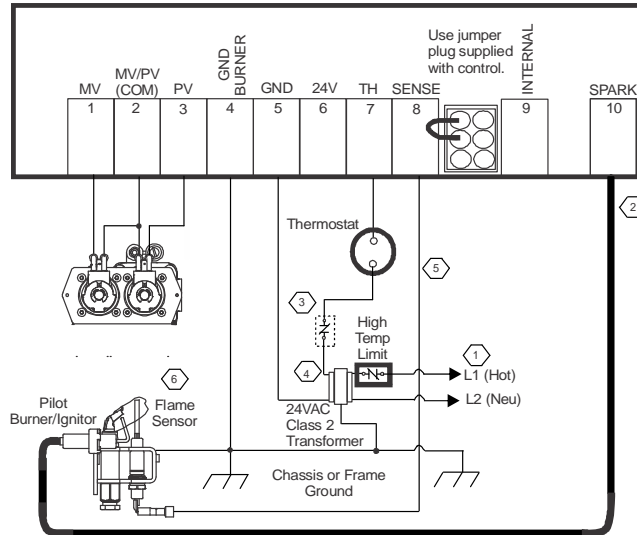


WARNING: Risk of Electric Shock.

Before applying power to the control, connect the high voltage cable to the spark transformer terminal and spark electrode (pilot burner assembly). Verify the ground wire is attached to the pilot burner and the control ground terminal strip. Failure to follow this procedure can cause electric shock and may result in severe personal injury or death.

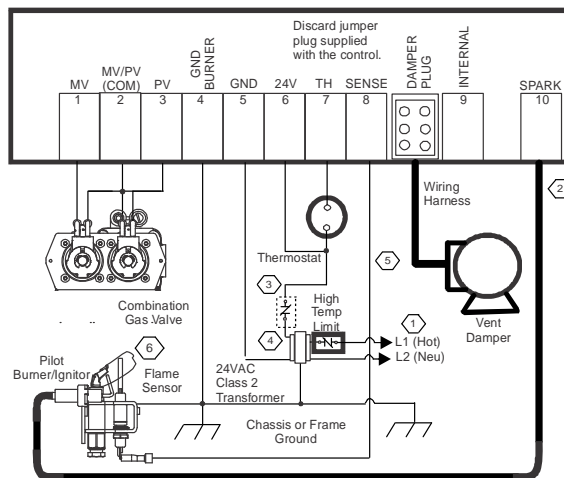
The BGQ15HAA-1 replaces existing intermittent pilot ignition controls with the following specifications:

- flame detection using flame rectification technology (ability of a flame to conduct and rectify current)
- trial for ignition 1 trial
- dual rod (remote sense) flame sensing
- no retry
- infinite trial time
- prepurge period of none
- inter-purge period of 5 seconds
- main burner 400,000 Btu/hr maximum
- pilot burners with flow rates of 1,500 Btu/hr or less
- with or without automatic vent damper
- must be used with redundant gas valves and not subjected to temperatures below -40°F (-40°C) or above 170°F (77°C)



- ① Power Supply. Provides disconnect means and overload protection as required.
- ② Maximum cable length 48 inches (1,220 mm). (Resistive wire recommended.)
- ③ Alternate location for limit controller.
- ④ Controls in 24V circuit must not be in ground leg to transformer.
- ⑤ Maximum cable length 48 inches (1,220 mm).
- ⑥ Sensor rod must be 3/8" (9.53 mm) to 1/2" (12.7 mm) of the sensor tip should be in the flame for proper sensing signal.

Figure 3: Wiring for 2 Rod Flame Sense with Vent Damper Jumper Plug



Note: If a damper is not used (see Figure 3), use pin 2-3 jumper plug supplied with the control and omit 24V connection.

- ① Power Supply. Provides disconnect means and overload protection as required.
- ② Maximum cable length 48 inches (1,220 mm). (Resistive wire recommended.)
- ③ Alternate location for limit controller.
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Figure 4: Wiring for 2 Rod Flame Sense with Vent Damper

Setup and Adjustments

Electrical and Mechanical Checkout Procedure

After the BGQ15HAA-1 installation is complete, perform the following procedures to ensure the installation is correct. While performing the following procedure, keep the high voltage cable and the sensing probe cable away from hot surfaces.

1. Measure the output current in the probe circuit using a DC microammeter. Connect the microammeter leads between the sensing probe cable and Terminal 8 on the ignition control. Connect the positive lead to Terminal 8 and the negative lead to the sensing probe cable (Figure 5).

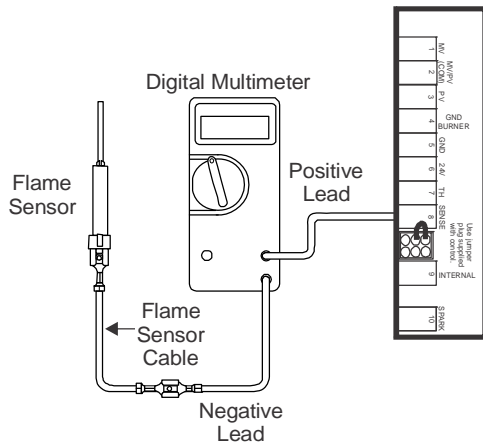


Figure 5: Wiring Diagram for Flame Sensing Current Measurement

2. Remove the main valve lead from Terminal 1 on the ignition control. Attach the on/off toggle switch between the ungrounded post of the transformer and Terminal 7 on the ignition control. The toggle switch serves as the thermostat for testing procedures. Make sure the thermostat contacts are open.
3. Open the main manual shutoff valve to turn on the gas supply.
4. Restore power to the furnace or boiler and flip the toggle switch to the On or closed position. The pilot valve opens and a spark jumps the spark gap at the pilot.
5. Test for leaks at the pilot tubing connections with a soap solution. In a few seconds, the spark lights the pilot after the air is bled from the pilot gas line.

Note: Once the pilot flame is lit, the microammeter shows a reading from the flame sensing probe. The current reading should be at least 0.15 microampere. If the reading is less than 0.15 microampere, turn off the electrical power and adjust the pilot assembly by adding spacers between the pilot bracket and the sensing probe assembly. No more than 1/2 in. of the flame sensor tip should be in the pilot flame. If this does not correct the current reading, it may be necessary to increase the pilot burner orifice size. Recheck until the reading is satisfactory.

6. Flip the toggle switch to the Off or open position.
7. Reconnect the main valve lead to Terminal 1 on the ignition control.
8. Flip the toggle switch to the On or closed position. The pilot should light and immediately thereafter, the main burner should light.
9. Check the outlet pressure reading by removing the pressure tap plug and connecting a manometer. Compare it with the furnace or boiler specifications. It may be necessary to adjust the pressure regulator to the rating indicated (see the *Regulator Adjustment* section).

Turndown Test Procedure

With the toggle switch still connected, perform the following turndown test to assure main burner ignition under conditions that permits the main valve to open.

1. Slowly close the manual shutoff valve until the pilot flame is just sufficient to maintain operation of the main burner.
2. Cycle the main burner off and on with the toggle switch. Perform this test with the furnace or boiler burner cold and hot.
3. If the furnace or boiler cycles without igniting the main burner in four seconds, ensure the pilot is properly located and correct for the application.
4. Completely open the main manual shutoff valve.
5. If unstable burner lighting occurs, causing the ignition control to chatter on and off during startup, install the flame rectification extension as follows.
 - a. Place the sensor probe extension and bushing onto the flame sensing probe.
 - b. Position the extension over the main burner so it extends into the flame.
 - c. Secure the extension in place by tightening the extension probe into the bushing.

Note: The sensor probe extension detects the main burner flame and the BG1600M ignition control allows continued operation until a stabilized pilot is maintained.

6. Ensure the thermostat contacts are open and remove the toggle switch.
 7. Remove the microammeter and reconnect the sensor probe lead to Terminal 8 on the ignition control.
 8. Shut off the gas supply at the main manual shutoff valve, disconnect the manometer, and replace the pressure tap plug.
- Note:** The thermostat heat anticipator setting should be set for 0.4 ampere (current draw of the BGQ15HAA-1 gas valve). When using an automatic vent damper, add the current draw of the vent damper to the 0.4 ampere of the gas valve. The transformer should be checked to make sure it has sufficient capacity to operate the additional load.
9. Reopen the main manual shutoff valve.
 10. Perform the *Checkout* section before leaving the installation.

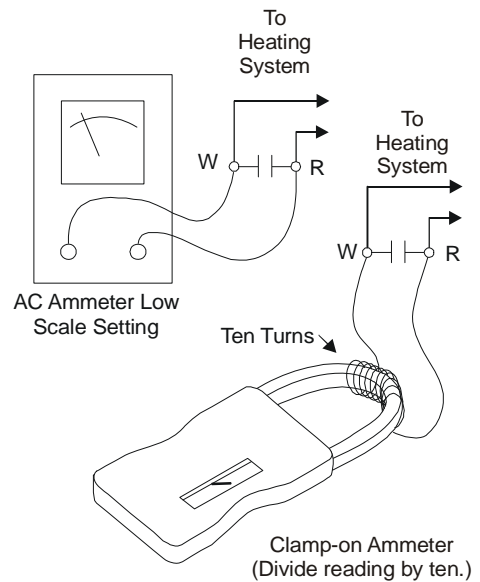


Figure 6: Measuring the Thermostat Current

Thermostat Heat Anticipator Settings

The anticipator setting is normally equal to the ignition system current, plus that of the pilot and main valve.

Due to variations in appliance wiring and valves, it is advisable to measure the actual current draw of the heating system at the thermostat location. Measuring this current can be accomplished by opening the thermostat contacts (lowering the setpoint) and installing an AC ammeter across the terminals, or by using a clamp-on ammeter with a 10-turn multiplier attached to the terminals (Figure 6).

! WARNING: Risk of Personal Injury. Do not take a current draw measurement unless the appliance is in the run condition. Measuring the current with an ammeter will energize the system. This may cause the appliance to proceed to the run condition unexpectedly, and may result in severe personal injury or death.

Regulator Adjustment

! WARNING: Risk of Explosion or Fire. Do not adjust the minimum flow rate of the valve below the minimum safe working rate of the appliance. This may cause gas leaks, which can lead to an explosion or fire, and may result in severe personal injury or death.

IMPORTANT: Refer to and follow any specific instructions issued by the appliance manufacturer with regards to servicing their equipment.

The pressure regulator is adjustable and has been factory set at 3.5 in. W.C. (8.75 mbar). If a different setting is desired, follow these instructions.

1. Shut off all gas to the appliance.
2. Turn the thermostat to the lowest setting or Off position.
3. Remove the pressure tap plug at the valve outlet or in the manifold pipe downstream of the valve.
4. Install a manometer or pressure gauge suitable for measuring the desired orifice pressure.

5. Remove the seal screw at the end of the regulator stack.
 6. Turn the gas on and place the thermostat at the highest setting to cycle the ignition system.
 7. Allow the system to stabilize. Adjust the screw in the regulator stack to the desired reading on the manometer. (Turn clockwise to increase the outlet pressure and counterclockwise to reduce the outlet pressure.)
 8. Reinstall the seal screw, which incorporates the proper size hole for venting to the atmosphere. (It may be necessary to cycle the valve several times to verify the desired outlet pressure.)
 9. Turn off the gas supply and place the thermostat at the lowest setting.
 10. Remove the manometer and reinstall the pressure tap plug.
 11. Turn the gas on and check for leaks at the pressure tap plug with a soap solution.
 12. Set the thermostat to the desired setting before leaving the site.
3. Turn the thermostat to a high setting and verify that the control goes through the operating sequence to a shutoff condition.
Note: The burner does not light because the gas is off.
 4. Turn off the thermostat.
 5. Turn on the gas and purge gas lines of all air.
 6. Check for gas leaks on all pipe joints upstream of the gas valve with a soap solution.
 7. Turn the thermostat to the highest setting and verify successful ignition and a normal run condition for at least 5 minutes. If the appliance fails to run, see the *Troubleshooting* section.
 8. Check for gas leaks on all pipe joints downstream of the gas valve with a soap solution.
 9. Turn the thermostat down for at least 30 seconds and then back up again. Verify successful ignition at least five times.
 10. Return the thermostat to a normal temperature setting before leaving the installation.

Checkout



WARNING: Risk of Explosion or Fire. Follow this or an equivalent checkout procedure after installation. Before leaving the installation, verify that the BGQ15HAA-1 functions properly and that the system has no gas leaks. Gas leaks can lead to an explosion or fire, and may result in severe personal injury or death.



WARNING: Risk of Explosion or Fire. Verify that there are no gas leaks by testing with appropriate equipment. Never use a match or lighter to test for the presence of gas. Failure to test properly can lead to an explosion or fire and may result in severe personal injury or death.

Make sure all components function properly by performing the following test.

1. Before starting the appliance, perform a safety inspection of piping, burners and venting. Check for water leaks, etc. Check all wiring for proper connections. Be sure the system is properly grounded, including ground connection to the pilot burner.
2. With the gas and thermostat off, turn on power to the appliance.



WARNING:

The control module can not be serviced by user. If any faults are detected, the control module must be replaced. If control module has been opened or any attempts to repair are done, the warranty is void.

Operation

Operating Mode Definitions

The following definitions describe the BG1600M operating conditions.

- **Prepurge:** Initial time delay between thermostat contact closure and activation of the spark circuit and pilot valve.
- **Trial for Ignition:** Total time the pilot valve is energized and spark/sense sequence is activated in an attempt to light the pilot. The control attempts to prove flame within the trial-for-ignition time.
- **100% Shutoff:** If the control does not prove the presence of pilot burner flame within the trial for ignition, the spark circuit and pilot valve are de-energized.
- **Recycle:** If 100% shutoff occurs, the control delays for a specific recycle delay period before beginning another trial for ignition (models with recycle only).

- **Run:** Main valve is energized and spark turns off after pilot flame is proven. The main valve remains energized until the thermostat is satisfied.
- **Flameout:** Loss of proven flame. Should a flameout occur, the main valve de-energizes and spark recurs within 2.0 seconds.
- **Lockout:** An internal or external fault has caused the control to de-energize the spark circuit and valve relays. The thermostat contacts must be opened for 30 seconds and then closed to begin another trial for ignition.
- **Inter-Purge:** Period between trials for ignition when both the gas valve and spark are de-activated to allow unburned gas to escape before the next trial.

Sequence of Operation

The heating cycle start when a call for heat from the thermostat supplies 24VAC to the TH terminal. The automatic vent damper (if used) is energized and when fully open, turns on the power to the ignition control. After a 1 second maximum diagnostic period, the spark will start and the pilot valve will turn on, starting with the trial for ignition period.

During the trial for ignition period, the control sparks for 4 seconds while rapidly flashing LED. It then turns off the spark and LED for 1 second while checking pilot flame sense. This cycle will repeat until pilot flame is detected or trial time is over.

When pilot flame is detected, the spark will stop, main valve will turn on and the LED will stay on continuously. The control will remain in this state until the pilot flame is lost or the call for heat ends. If pilot flame is lost, LED, main and pilot valves are turned off for 0.5 seconds and a new trial for ignition sequence will start.

If pilot flame is not detected during the trial for ignition period, the pilot valve will be shut off. Lockout will occur if your model has no retry. Otherwise, after 5 minutes or 60 minutes (for recycle units only) the control will delay for the specific recycle delay period before beginning another trial for ignition.

Table 1: LED Indications During Normal Operation

Flash Code	Flash Code Indication
Steady On	Flame detected, main burner on
.1 Second On .1 Second Off	Trial time spark on trying to light pilot burner
1.0 Second On 4.0 Second Off	2 minute recycle delay time

Troubleshooting

If the system does not function properly, determine the cause using the procedures in this section.

Before proceeding with troubleshooting the system, check the following.

Preliminary Checks

- Are you using resistive wire between the module spark (10) and the pilot connection?
- Are all mechanical and electrical connections tight?
- Is the system wired and ground correctly?
- Is gas inlet pressure per manufacturer's specifications?
- Is the system powered?
- Is the thermostat calling for heat?



WARNING: Risk of Personal Injury.

Do not place face, hands, or other parts of the body in or near the burner area when the LED is flashing (recycle mode). When the LED is flashing, the control may at any time (while in the recycle mode) re-energize the burner control system and ignite the burner which may result in electric shock from contact with the electrode or severe burn injury from firing of the burner.

LED Error Indications

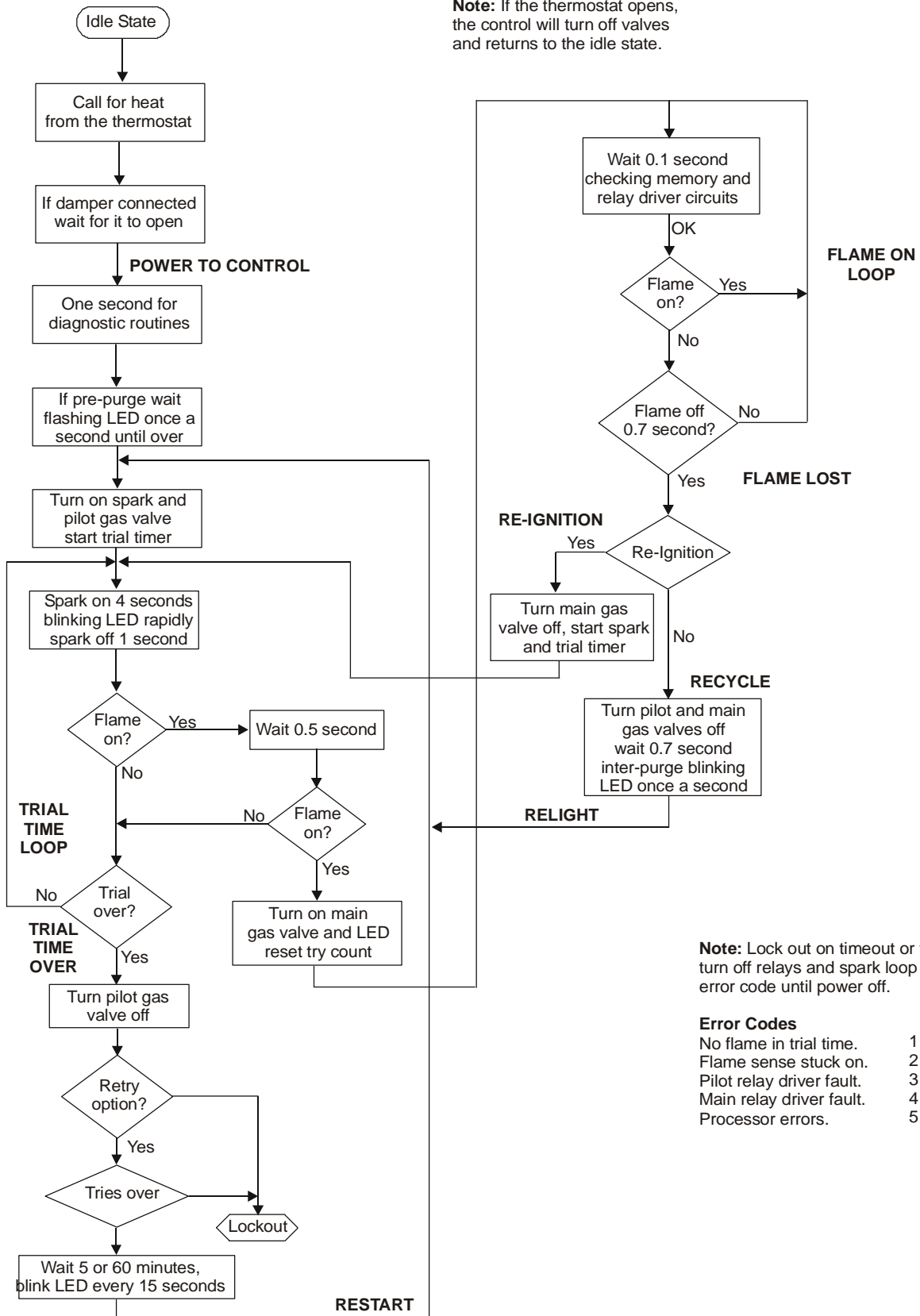
If the control module's internal diagnostics detect a fault it will go into lockout. Spark and both valves will be turned off. The LED will flash an error code .25 seconds on and .25 seconds off for each count of the error code with 1 second off between codes. The control will remain in this condition until power is removed by turning off the call

for heat. A flashing LED error code indicates either a problem with wiring, or a component not working, or the control module is faulty. Try to cycle the control again. If the error repeats then see Table 2 for troubleshooting.

Table 2: LED Error Indications

Flash Code	Flash Code Description	Troubleshooting Guide
No LED "ON"	No Power	<ol style="list-style-type: none"> 1. Check Controller for a Molex connection; <ol style="list-style-type: none"> 1.1. Controller w/MOLEX connector and the Vent Damper jumper plug installed, check for 24 volts on terminal 7 (TH) and terminal 5 (GND). If using a Vent Damper, make sure it is connected and the damper is working, check for 24 volts on terminal 6 (24V) and terminal 7 (TH) to terminal 5 (GND). 1.2. Controller w/o MOLEX connector, check for 24 volts on terminal 6 (24V) and terminal 5 (GND). 2. Check for 24 volts on the secondary coil of the incoming transformer.
1	No flame in trial time	<ol style="list-style-type: none"> 1. Check if the gas is turned "ON". 2. Check Controller for a Molex connection; <ol style="list-style-type: none"> 2.1. Controller w/MOLEX connector and the Vent Damper jumper plug installed, check for 24 volts on terminal 7 (TH) and terminal 5 (GND). If using a Vent Damper, make sure it is connected and the damper is working, check for 24 volts on terminal 6 (24V) and terminal 7 (TH) to terminal 5 (GND). 2.2. Controller w/o MOLEX connector, check for 24 volts on terminal 6 (24V) and terminal 5 (GND). 3. If no spark, check spark wire and connection to terminal 10 (SPARK) and spark ground to terminal 4 (GND BURNER). 4. Check if PV is wired to terminal 3 (PV) and common is wired to terminal 2 (MV/PV COM). 5. Check for 24 volts at the PV coil.
2	Flame sense circuit error	<ol style="list-style-type: none"> 1. Check Flame Sensor tip is in the flame. For proper sensing the rod tip must be 3/8" (10mm) to 1/2" (13 mm) in the flame. 2. Check Flame Sensor Circuits; <ol style="list-style-type: none"> 2.1 For 1 Rod Flame Sense circuit, check Spark/Flame Sensor is wired to terminal 10 (SPARK) and terminal 4 (GND BURNER). 2.2 For 2 Rod Flame Sense circuit, check Flame Sensor is wired to terminal 8 (SENSE) and terminal 4 (GND BURNER).
3	PV (Pilot Valve) circuit error	<ol style="list-style-type: none"> 1. Check for 24 volts on terminal 3 (PV) and terminal 2 (MV/PV COM). 2. Check for 24 volts at the PV coil. 3. Check if PV is wired to terminal 3 (PV) and common is wired to terminal 2 (MV/PV COM).
4	MV (Main Valve) circuit error	<ol style="list-style-type: none"> 1. Check for 24 volts on terminal 1 (MV) and terminal 2 (MV/PV COM). 2. Check for 24 volts at the MV coil. 3. Check MV is wired to terminal 1 (MV) and common is wired to terminal 2 (MV/PV COM).
5	Internal Control error	<ol style="list-style-type: none"> 1. Review all ground connections. 2. Check if using fiber core resistive wire for Spark Wire.
6 to 9	Internal Control error	<ol style="list-style-type: none"> 1. Software error – Restart control module.

NOTE: If Troubleshooting Guide has been used, and the Control Module is flashing an ERROR CODE, then the Control Module may be faulty. Replace the Control Module.



Note: Lock out on timeout or fault detected, turn off relays and spark loop blinking error code until power off.

Error Codes

No flame in trial time.	1 Blink
Flame sense stuck on.	2 Blinks
Pilot relay driver fault.	3 Blinks
Main relay driver fault.	4 Blinks
Processor errors.	5 to 9 Blinks

Figure 7: Sequence of Operation

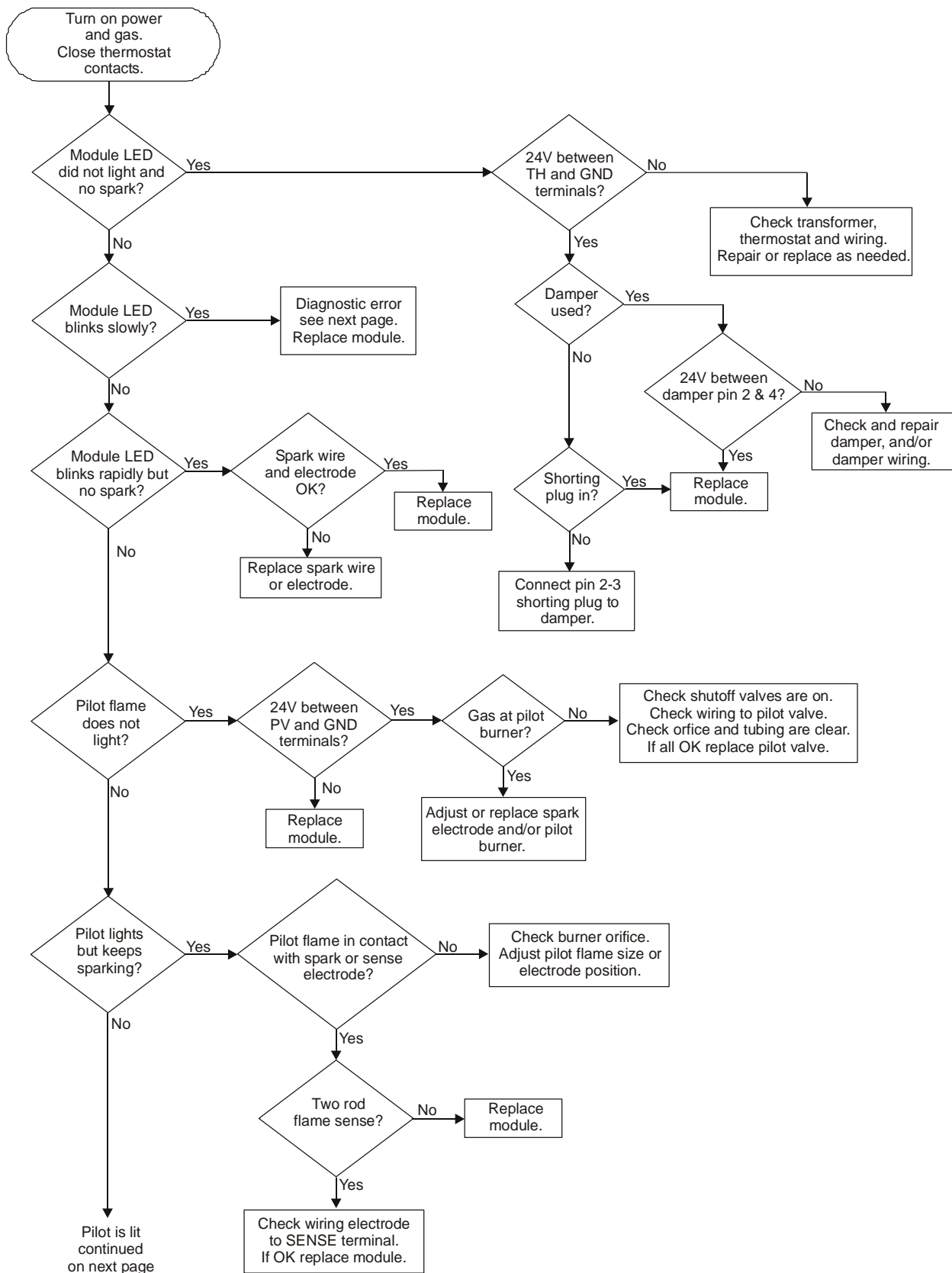


Figure 8: Troubleshooting Flow Chart (1 of 2)

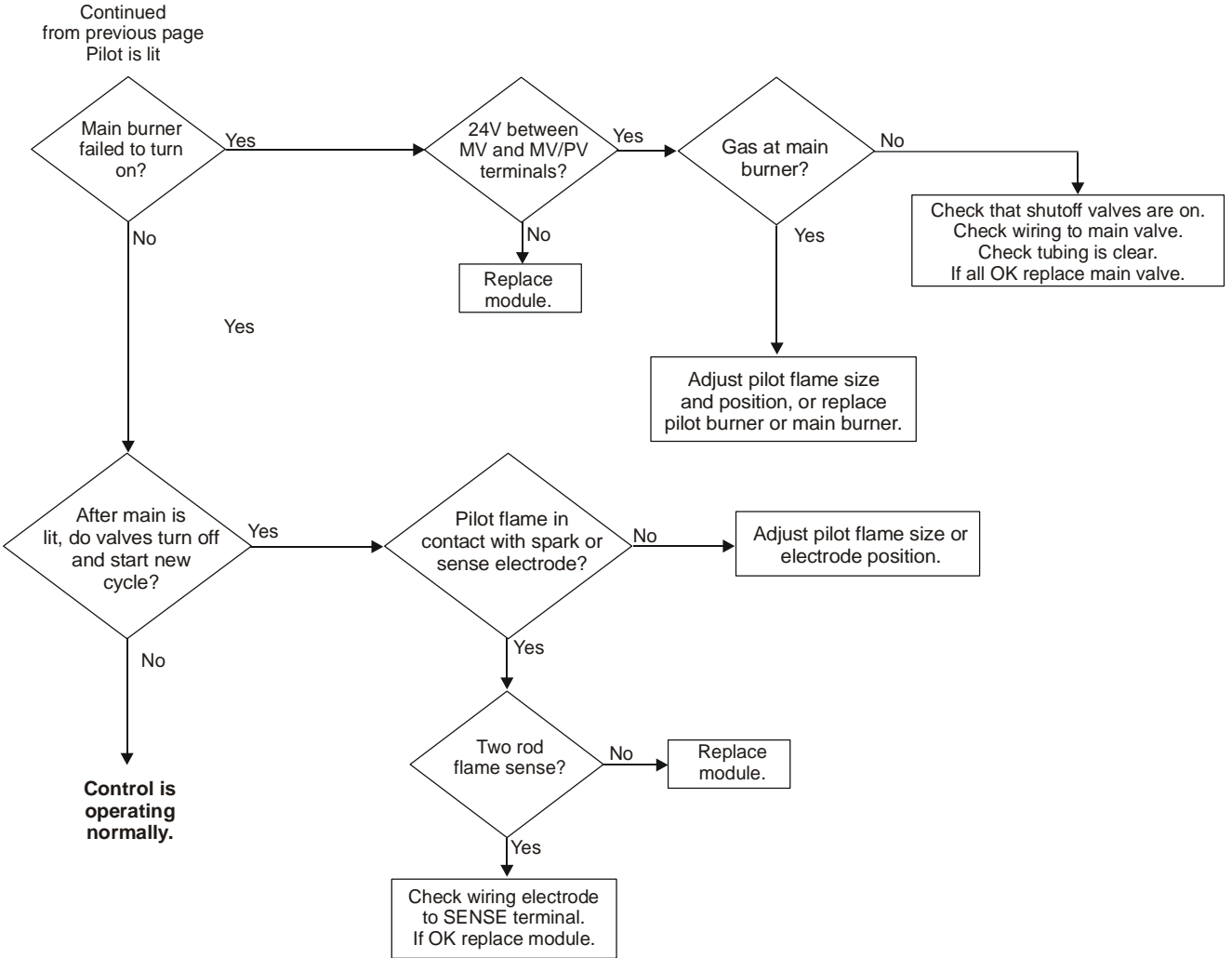


Figure 9: Troubleshooting Flow Chart (2 of 2)

Maintenance Requirements in Severe Environments

Regular preventive maintenance is important in any application, but especially so in commercial cooking, agricultural, and industrial applications because:

- In many such applications, particularly commercial cooking, the equipment operates 100,000 to 200,000 cycles per year. Such heavy cycling can wear out the gas control in one to two years. A normal forced air furnace, for which the controls were originally intended, typically operates less than 20,000 cycles per year.
- Exposure to water, dirt, chemicals, and heat can damage the ignition control module or the gas control and shut down the control system. A NEMA 4 enclosure can reduce exposure to environmental contaminants.



WARNING: Risk of Explosion or Fire. Do not attempt to take the ignition control module apart or to clean it. Improper reassembly and cleaning may cause unreliable operation, which can lead to an explosion or fire, and may result in severe injury, property damage or death.

Maintenance frequency must be determined individually for each application. Some considerations are:

- **Cycling Frequency** – Appliances that may cycle more than 20,000 times annually should be checked monthly.
- **Intermittent Use** – Appliances that are used seasonally should be checked before shutdown and again before the next use.
- **Consequence of Unexpected Shutdown** – Where the cost of an unexpected shutdown would be high, the system should be checked more often.
- **Dust, Wet, or Corrosive Environment** – Since these environments can cause the controls to deteriorate more rapidly, the system should be checked more often.

Repairs and Replacement



CAUTION: Risk of Electric Shock.

Disconnect power supply before making electrical connections to avoid electric shock.



WARNING: Risk of Explosion or Fire.

Shut off the gas supply at the main manual shutoff valve before installing or servicing the control. Failure to shut off the gas supply can result in the release of gas during installation or servicing, which can lead to an explosion or fire, and may result in severe injury or death.



WARNING: Risk of Explosion, Fire, or Electric Shock. Label all wires before they are disconnected when replacing or servicing the BGQ15HAA-1. Wiring errors can cause improper or dangerous operation and may result in an explosion, fire, or electric shock leading to severe personal injury or death.

Field repairs must not be made to the BGQ15HAA-1 control. Any attempt to repair this assembly voids the manufacturer's warranty. For a replacement control, contact the original equipment manufacturer or the nearest BASO Gas Products distributor.

All other accessories, such as flame sensors, electrode assemblies, pilot assemblies, and leads can be obtained through the original equipment manufacturer or a BASO Gas Products distributor.

Ignition Control Accessories

Table 3: Ignition Control Accessories

Part Number	Description
RAA1600A-601D	Rajah to 1/4" Spade Adapter (box of 50)
RAA1600A-601H	Rajah to 1/4" Spade Adapter (bag of 10)
WHA40A-600D	18" Resistive Wire Harness with (2) 1/4" Terminals (box of 25)
WHA40A-600H	18" Resistive Wire Harness with (2) 1/4" Terminals (bag of 1)
WHA40A-601D	18" Resistive Wire Harness with (1) 1/4" Terminal and 1 Rajah Terminal (box of 25)
WHA40A-601H	18" Resistive Wire Harness with (1) 1/4" Terminal and 1 Rajah Terminal (bag of 1)
WHA40A-602D	24" Resistive Wire Harness with (2) 1/4" Terminals (box of 25)
WHA40A-602H	24" Resistive Wire Harness with (2) 1/4" Terminals (bag of 1)
WHA40A-603D	24" Resistive Wire Harness with (1) 1/4" Terminal and 1 Rajah Terminal (box of 25)
WHA40A-603H	24" Resistive Wire Harness with (1) 1/4" Terminal and 1 Rajah Terminal (bag of 1)
WHA40A-604D	36" Resistive Wire Harness with (2) 1/4" Terminals (box of 25)
WHA40A-604H	36" Resistive Wire Harness with (2) 1/4" Terminals (bag of 1)
WHA40A-605D	36" Resistive Wire Harness with (1) 1/4" Terminal and 1 Rajah Terminal (box of 25)
WHA40A-605H	36" Resistive Wire Harness with (1) 1/4" Terminal and 1 Rajah Terminal (bag of 1)
WHA40A-606D	48" Resistive Wire Harness with (2) 1/4" Terminals (box of 25)
WHA40A-606H	48" Resistive Wire Harness with (2) 1/4" Terminals (bag of 1)
WHA40A-607D	48" Resistive Wire Harness with (1) 1/4" Terminal and 1 Rajah Terminal (box of 25)
WHA40A-607H	48" Resistive Wire Harness with (1) 1/4" Terminal and 1 Rajah Terminal (bag of 1)

Technical Specification

Product	BG1600M10EK-1AA Intermittent Pilot Ignition Control	
Ignition Type	Indirect	
Ignition Source	High voltage spark, capacitive discharge	
High Voltage Cable Maximum Length	48 in. (1,220 mm) (Resistive wire recommended, rated for at least 15kV.)	
Flame Sense Cable Maximum Length	48 in. (1,220 mm)	
Flame Detection Means	Flame Rectification	
Flame Detection Type	Remote	
Minimum Flame Current	0.15 microamperes	
Flame Failure Response Time	2 seconds maximum	
Maximum Spark Gap	0.2 in. (5.1 mm)	
Number of Trials Before 100% Shutoff	One	
Trial-for-Ignition Time	Infinite	
Prepurge Time	None	
Inter-Purge Time	5 seconds	
Automatic Recycle Delay Period	None	
Power Requirements	Control:	24 VAC (+/- 20%), 50/60 Hz
	Operation Current:	0.2 A nominal + valves
Contact Rating	Main Valve:	2 A maximum
	Pilot Valve:	1 A maximum
Wiring Connections	1/4 in. (6.35 mm) male spade	
Maximum Firing Rate	400,000 Btu/hr (117 kW)	
Ambient Operating and Storage Temperature	-40 to 170°F (-40 to 77°C)	
Humidity	95% RH noncondensing	
Type of Gas	Natural, Liquefied Petroleum (LP), Manufactured, Mixed or LP Gas-Air Mixture	
Packaging	Bulk pack supplied to original equipment manufacturer (25 per box) Individual pack (1 per box) Individual overpack (20 per box)	
Pack Weight	Bulk pack 14 lb (6.36 kg) Individual pack 1 lb (.454 kg) Individual overpack 18 lb (8.17 kg)	
Agency Listing	CSA Certificate Number 246569-2161442	
Specifications Standards	ANSI Standard Z21.20 CAN/CSA-C22.2 No. 199	

The performance specifications are nominal and conform to acceptable industry standards. All agency certification of BASO products is performed under dry and controlled indoor environmental conditions. Use of BASO products beyond these conditions is not recommended and may void the warranty. If the product is exposed to water (dripping, spraying, rain, etc.) or other harsh environments, it must be protected. The original equipment manufacturer or end user is responsible for the correct application of BASO products. For questionable applications, please consult BASO Gas Products LLC. BASO Gas Products LLC shall not be liable for damages or product malfunctions resulting from misapplication or misuse of its products.

Technical Specifications

Product	BGD278JBE-20BCGD Gas Valve
Maximum Operating Pressure	0.5 psi (35 mbar)
Permissible Ambient (Surface) Temperature	-20 to 175°F (-29 to 79°C)
Valve Body	Aluminum
Electrical Rating	25 VAC, 60 Hz, 0.42A, 10.5 VA per coil
Electrical Connection	3-Tab Solenoid Coil: 2 x 1/4 in. (6.35 mm) + 1/4 in. (6.35 mm) Earth Ground
Regulator Adjustment Range	3 to 6 in. W.C. (7.5 to 15 mbar)
Inlet Pipe Size	1/2 in. NPT
Outlet Pipe Size	3/4 in. NPT
Wiring Connections	Wire Harness Pre-Wired
Coil Insulation Class	Class F
Type of Gas	Natural
Agency Listing	CSA (AGA/CGA) Certification Number 229521-1656041
Specification Standard	ANSI Z21.78, CSA 6.20

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